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impart the knowledge through the medium of clear and forcible language; and there are indications that both the preparatory schools and the universities are awaking to a realization of this fact.

P. C. WARMAN.

A CONTRIBUTION TO THE CRANIOLOGY OF THE PEOPLE OF SCOTLAND.\*

UNDER this title Professor Sir William Turner, than whom no one is better qualified to deal with this subject, presents the first systematic account of the cranial characters of the people of Scotland. The study is based on 176 carefully gathered skulls (117 males and 59 females) obtained principally in the counties south of the Clyde and Tay ('lowland Scotland').

The memoir is written in the same clear style, eminently fit for instruction, which marks all the works of this author, and the results of the study are of much interest. These results are briefly summarized as follows:

"The Scottish cranium is large and capacious; the vertex is seldom heeled or roof-like, but has a low rounded arch in the vertical transverse plane at and behind the bregma." The side walls "bulge slightly outwards in the parieto-squamous region, so that the greatest breadth is usually at or near the squamous suture. The occipital squama bulges behind the inion." The glabella and supraorbital ridges, in men, 'are fairly but not strongly pronounced, the forehead only slightly recedes from the vertical plane and the nasion is scarcely depressed.'

From the "analysis of the cephalic indices, it would appear that a brachycephalic type of skull prevailed in Fife, in the Lothians, in the northeast counties of Forfar, Kincardine and Banff; and it occurred to some extent in Shetland, in Ayr, in the border county of Peebles, and in Stirlingshire."

"The dolichocephalic type of skull was feebly represented in Fife; it was proportionally more numerous in the Lothians; it

was represented in Lanark, Ayr, Shetland and the Hebrides. It formed the prevailing type in Wigtonshire, in Caithness, in the skulls from the Highland counties, and in the important series of skulls from Renfrewshire."

The vertical diameter—basion-bregma—(mean, in males, 132.4 mm.), was only in two out of 150 of the Scottish crania in which the measurement would be taken in excess of the breadth; the two measurements were equal in four others, while 'in all the rest, whether cephalic index was high or low, the vertical diameter was less than the breadth.' 'The Scottish skulls are platychamæcephalic.'

Among the 73 male and 42 female crania that were cubed (with shot, according to Turner's method), 'the maximum capacity in the male skulls was 1,855 c.c., the minimum was 1,230 c.c., and the mean was 1,478 c.c.'; 'the maximum in the female was 1,625 c.c., the minimum 1,100 c.c. and the mean 1,322 c.c.' Apparently the Scottish male skull is 'somewhat in excess of the mean ascribed to the crania of European men.' The female skull, similarly as in other races and people, is about ten per cent. less capacious than the male.' 'In twenty-five male dolichocephalic crania the mean capacity was 1,516 c.c.'; in twenty-one male crania of cephalic index 'from 75 to 77.4, the mean capacity was 1,519 c.c.'; in fifteen with cephalic index of '77.5 to 79.9, the mean capacity was 1,452 c.c.'; and 'in thirteen brachycephalic skulls the mean capacity was 1,469 c.c.' The Scottish skulls 'with dolichocephalic proportions had a distinctly greater mean capacity than the brachycephalic.'

The highest mean cranial capacity was given in the males, 'by the skulls from Fife, Mid-Lothian, Shetland and Renfrewshire'; while the mean was lowest in the skulls 'from Edinburgh and Leith, West Lothian, the northeastern counties, the highland counties and the dissecting-room.'

"The face was usually orthognathous, sometimes mesognathous; the nose was prominent, long and narrow, leptorrhine; the orbits had usually the vertical diameter high in relation to the transverse, mesoseme or megaseme; the

\* *Trans. Roy. Soc. Edinburgh*, Vol. XL, Part III., No. 24, 1903.

face was high in relation to the width, leptoprosopic." "The lower jaw had a well-defined angle, the body of the bone was massive in the males, and with a pronounced chin."

So much for this first memoir, which leaves to be desired only greater numbers of specimens from some of the counties and, especially with the relation to cranial capacity, estimates of height of the individuals. A second memoir, to contain an account of prehistoric Scottish skulls, as well as 'a discussion of the character of Scottish crania and heads in their general ethnographical relation to prehistoric races in Britain, and to the people of the adjoining part of the continent of Europe' is to follow.

A. HRDLICKA.

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VERTEBRATE PALEONTOLOGY AT THE CARNEGIE  
MUSEUM.

THROUGH the continued generosity of Mr. Carnegie the usual activity has been maintained during the past year in the Department of Vertebrate Paleontology at this museum.

*The Bayet Collection of Fossils.*—Negotiations begun more than a year ago by the present writer resulted in July in the acquisition of the paleontological collections of Baron de Bayet of Brussels, Belgium. This collection is especially rich in Mesozoic vertebrates from Solenhofen, Cerin, Holzmaden, Lyme Regis and the province of Benevento, Italy; in Tertiary fishes and other vertebrates, invertebrates and plants from the famous locality of Monte Bolca, near Verona, Italy; from Armissan, near Narbonne, France; from the Belgian Tertiaries; from Sicily, etc. It also contains large and valuable collections of insects and other invertebrates from the Solenhofen beds of Bavaria, a superb collection of European cephalopoda from the Mesozoic and of Paleozoic trilobites and other invertebrates.

Though containing no types and little that is new to paleontology, its acquisition by an American museum is of importance as making accessible for the first time to American stu-

dents any considerable collection of European vertebrates without the necessity of a trip to Europe. Dr. C. R. Eastman has undertaken to prepare a memoir descriptive of the fishes in the collection, and it is the desire of the curator of the department to arrange for the treatment of the other groups in a similar manner by equally competent specialists, so that the material in the collection may be made known and available for purposes of comparison to students of paleontology.

It will doubtless be many years before a similar opportunity will present itself for acquiring at a single stroke so large and varied a collection of European fossil vertebrates, and American paleontologists are indebted to Mr. Carnegie for his generosity in supplying the funds necessary for the purchase of this valuable collection.

*Field Work during the Season of 1903.*—During the season just drawing to a close four parties have been engaged, under the general direction of the curator, in studying the geology and in collecting vertebrate and other fossils from various Tertiary, Mesozoic and other horizons of the west, chiefly in Kansas, Wyoming and Montana.

Pursuant to a general plan undertaken some time since, Mr. Earl Douglass has continued his explorations of the Tertiary lake basins of western Montana and has been successful in securing considerable collections representative of the fossil faunas and floras of those deposits. Of greatest importance among the results of his labors in that region may be mentioned the discovery of Oligocene beds referable to the White River and containing the remains of a rich and varied vertebrate fauna in a good state of preservation. Heretofore the White River formations of that region have yielded comparatively few and for the most part poorly preserved vertebrates. In addition to his work in the Tertiary Mr. Douglass was also able to make some interesting collections from, and observations relating to the Carboniferous and Permian(?) of that region.

During the earlier part of the season Mr. C. W. Gilmore was engaged in completing the